AP Statistics – Classwork

Chapter 3

Smoking and Education

200 adults shopping at a supermarket were asked about the highest level of education they had completed and whether or not they smoke cigarettes. Results are summarized in the table.

1. Discuss the W’s.

2. Identify the variables.

3. a) What percent of the shoppers were smokers with only high school educations? ______
   b) What percent of the shoppers with only high school educations were smokers? ______
   c) What percent of the smokers had only high school educations? ______

4. Create a segmented bar graph comparing education level among smokers and non-smokers. Label your graph clearly

5. Do these data suggest there is an association between smoking and education level? Give statistical evidence to support your conclusion.

6. Follow-up question: Does this indicate that students who start smoking while in high school tend to give up the habit if they complete college? Explain.

<table>
<thead>
<tr>
<th></th>
<th>Smoker</th>
<th>Non-smoker</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>High school</td>
<td>32</td>
<td>61</td>
<td>93</td>
</tr>
<tr>
<td>2 yr college</td>
<td>5</td>
<td>17</td>
<td>22</td>
</tr>
<tr>
<td>4+ yr college</td>
<td>13</td>
<td>72</td>
<td>85</td>
</tr>
<tr>
<td>Total</td>
<td>50</td>
<td>150</td>
<td>200</td>
</tr>
</tbody>
</table>
Has the percentage of young girls drinking milk changed over time? The following table is consistent with the results from “Beverage Choices of Young Females: Changes and Impact on Nutrient Intakes” (Shanthy A. Bowman, *Journal of the American Dietetic Association*, 102(9), pp. 1234-1239):

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td></td>
<td>354</td>
<td>502</td>
<td>366</td>
<td>1222</td>
</tr>
<tr>
<td>No</td>
<td></td>
<td>226</td>
<td>335</td>
<td>366</td>
<td>927</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>580</td>
<td>837</td>
<td>732</td>
<td>2149</td>
</tr>
</tbody>
</table>

1. Find the following:
   a. What percent of the young girls reported that they drink milk? 
   b. What percent of the young girls were in the 1989-1991 survey?
   c. What percent of the young girls who reported that they drink milk were in the 1989-1991 survey?
   d. What percent of the young girls in 1989-1991 reported that they drink milk?

2. What is the marginal distribution of milk consumption?

3. Do you think that milk consumption by young girls is independent of the nationwide survey year? Use statistics to justify your reasoning.

4. Consider the following pie charts of the a subset of the data above:

   Do the pie charts above indicate that milk consumption by young girls is independent of the nationwide survey year? Explain.
To determine if people’s preference in dogs had changed in the recent years, organizers of a local dog show asked people who attended the show to indicate which breed was their favorite. This information was compiled by dog breed and gender of the people who responded. The table summarizes the responses.

1. Identify the variables and tell whether each is categorical or quantitative.

2. Which of the W’s are unknown for these data?

3. Find each percent.
   a. What percent of the responses were from males who favor Labradors?
   b. What percent of the male responses favor Labradors?
   c. What percent of the people who choose Labradors were males?

4. What is the marginal distribution of breeds?

5. Write a sentence or two about the conditional relative frequency distribution of the breeds among female respondents.

6. Do you think the breed selection is independent of gender? Give statistical evidence to support your conclusion.
In order to plan transportation and parking needs at a private high school, administrators asked students how they get to school. Some rode a school bus, some rode in with parents or friends, and others used “personal” transportation – bikes, skateboards, or just walked. The table summarizes the responses from boys and girls.

<table>
<thead>
<tr>
<th></th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bus</td>
<td>30</td>
<td>34</td>
<td>64</td>
</tr>
<tr>
<td>Ride</td>
<td>37</td>
<td>45</td>
<td>82</td>
</tr>
<tr>
<td>Personal</td>
<td>19</td>
<td>23</td>
<td>42</td>
</tr>
<tr>
<td>Total</td>
<td>86</td>
<td>102</td>
<td>188</td>
</tr>
</tbody>
</table>

1. Identify the variables and tell whether each is categorical or quantitative.

2. Which of the W’s are unknown for these data?

3. Find each percent.
   a) What percent of the students are girls who ride the bus?
   b) What percent of the girls ride the bus?
   c) What percent of the bus riders are girls?

4. What is the marginal distribution of gender?

5. Write a sentence or two about the conditional relative frequency distribution of modes of transportation for the boys.

6. Do you think mode of transportation is independent of gender? Give statistical evidence to support your conclusion.